

CASE STUDY

PROJECT SIZE: LARGE (\$25,000 – \$35,000)

TIMEFRAME: 2 – 3 MONTHS



Fibre Comparison of Genetically Modified Flax Cultivars

Client: The client was conducting research using genomics principles to develop new flax crop varieties and approached FibreCITY to analyze their straw.

Problem: The client needed to assess how the genomic modifications were impacting the straw's fibre content and properties. They also needed to determine if the changes were outside the range that could be expected from environmental conditions.

Details:

- The client was interested in select properties that could impact the value of the fibre's end uses.
- The client provided 16 flax samples, including 2 baseline samples from a flax variety commonly grown by farmers in the Canadian prairie region.

Recommended Tests & Rationale:

FibreCITY worked with the client to create a customized testing program to suit their needs. Due to the large number of samples, FibreCITY recommended using qualitative, less time-intensive tests on all of the samples initially and then investigating the most promising samples with more in-depth, time-intensive quantitative tests.

Initial evaluation (16 samples):

- **Organoleptic Testing** – comparing the samples using the senses of sight, smell and touch following a consistent approach to assess overall quality
- **Fried Test** – assessing the degree of ret to identify how significantly the samples may have been altered through retting in the field while being harvested
- **Fibre Content** – determining if the quantity of fibre had changed

Secondary evaluation (12 samples):

- **SEM Imaging of Stem Cross-sections** – comparing the fibre morphology of the samples, specifically to help consider maturity as a factor in fibre property differences

Third evaluation (6 samples):

- **Tensile Strength Testing** – comparing the mechanical strength and consistency of the fibres
- **FTIR Spectroscopy** – reviewing the chemical spectra of the samples to determine if the varieties showed differences in chemical compositions



Outcome

Of the genetically modified varieties, some did not perform as well as the baseline variety, but did fall within the ranges of changes caused by environmental conditions. The client elected to focus on the varieties that performed well for their next series of growing trials, knowing they favoured local growing conditions to produce good fibre.